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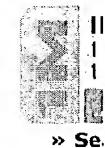
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### 1 Interactive multiresolution hair modeling and editing

Tae-Yong Kim, Ulrich Neumann

July 2002 **ACM Transactions on Graphics (TOG) , Proceedings of the 29th annual conference on Computer graphics and interactive techniques**, Volume 21 Issue 3

Full text available: pdf(9.63 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Human hair modeling is a difficult task. This paper presents a constructive hair modeling system with which users can sculpt a wide variety of hairstyles. Our Multiresolution Hair Modeling (MHM) system is based on the observed tendency of adjacent hair strands to form clusters at multiple scales due to static attraction. In our system, initial hair designs are quickly created with a small set of hair clusters. Refinements at finer levels are achieved by subdividing these initial hair clusters. U ...

**Keywords:** generalized cylinders, hair modeling, hair rendering, level of detail, multiresolution modeling

### 2 Heads, faces, hair: Head shop: generating animated head models with anatomical structure

Kolja Kähler, Jörg Haber, Hitoshi Yamauchi, Hans-Peter Seidel

July 2002 **Proceedings of the 2002 ACM SIGGRAPH/Eurographics symposium on Computer animation**

Full text available: pdf(9.67 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We present a versatile construction and deformation method for head models with anatomical structure, suitable for real-time physics-based facial animation. The model is equipped with landmark data on skin and skull, which allows us to deform the head in anthropometrically meaningful ways. On any deformed model, the underlying muscle and bone structure is adapted as well, such that the model remains completely animatable using the same muscle contraction parameters. We employ this general techni ...

**Keywords:** biological modeling, deformations, facial animation, geometric modeling, morphing, physically based animation

### 3 Face recognition: A literature survey

W. Zhao, R. Chellappa, P. J. Phillips, A. Rosenfeld  
December 2003 **ACM Computing Surveys (CSUR)**, Volume 35 Issue 4

Full text available: [pdf\(4.28 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

As one of the most successful applications of image analysis and understanding, face recognition has recently received significant attention, especially during the past several years. At least two reasons account for this trend: the first is the wide range of commercial and law enforcement applications, and the second is the availability of feasible technologies after 30 years of research. Even though current machine recognition systems have reached a certain level of maturity, their success is ...

**Keywords:** Face recognition, person identification

**4 Real-time fur over arbitrary surfaces**

Jerome Lengyel, Emil Praun, Adam Finkelstein, Hugues Hoppe

March 2001 **Proceedings of the 2001 symposium on Interactive 3D graphics**

Full text available: [pdf\(5.68 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

**Keywords:** hair rendering, lapped textures, volume textures

**5 Session 3: light: Opacity light fields: interactive rendering of surface light fields with view-dependent opacity**

Daniel Vlasic, Hanspeter Pfister, Sergey Molinov, Radek Grzeszczuk, Wojciech Matusik

April 2003 **Proceedings of the 2003 symposium on Interactive 3D graphics**

Full text available: [pdf\(4.60 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We present new hardware-accelerated techniques for rendering surface light fields with opacity hulls that allow for interactive visualization of objects that have complex reflectance properties and elaborate geometrical details. The opacity hull is a shape enclosing the object with view-dependent opacity parameterized onto that shape. We call the combination of opacity hulls and surface light fields the *opacity light field*. Opacity light fields are ideally suited for rendering of the visu ...

**Keywords:** 3D photography, image-based rendering

**6 Session P3: volume visualization I: Interactive translucent volume rendering and procedural modeling**

Joe Kniss, Simon Premoze, Charles Hansen, David Ebert

October 2002 **Proceedings of the conference on Visualization '02**

Full text available: [pdf\(37.78 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Direct volume rendering is a commonly used technique in visualization applications. Many of these applications require sophisticated shading models to capture subtle lighting effects and characteristics of volumetric data and materials. Many common objects and natural phenomena exhibit visual quality that cannot be captured using simple lighting models or cannot be solved at interactive rates using more sophisticated methods. We present a simple yet effective interactive shading model which capt ...

**Keywords:** procedural modeling, shading model, volume modeling, volume rendering

7 **Simulation: IMPaSTo: a realistic, interactive model for paint**

William Baxter, Jeremy Wendt, Ming C. Lin

June 2004 **Proceedings of the 3rd international symposium on Non-photorealistic animation and rendering**

Full text available:  pdf(1.01 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We present a paint model for use in interactive painting systems that captures a wide range of styles similar to oils or acrylics. The model includes both a numerical simulation to recreate the physical flow of paint and an optical model to mimic the paint appearance. Our physical model for paint is based on a conservative advection scheme that simulates the basic dynamics of paint, augmented with heuristics that model the remaining key properties needed for painting. We allow one active wet layer ...

**Keywords:** Non-photorealistic rendering, painting systems, simulation of traditional graphical styles

8 **Billboard clouds for extreme model simplification**

Xavier Décoret, Frédéric Durand, François X. Sillion, Julie Dorsey

July 2003 **ACM Transactions on Graphics (TOG)**, Volume 22 Issue 3

Full text available:  pdf(2.52 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We introduce *billboard clouds* -- a new approach for extreme simplification in the context of real-time rendering. 3D models are simplified onto a set of planes with texture and transparency maps. We present an optimization approach to build a billboard cloud given a geometric error threshold. After computing an appropriate density function in plane space, a greedy approach is used to select suitable representative planes. A good surface approximation is ensured by favoring planes that are ...

**Keywords:** LOD, billboard, error-driven simplification, image-based rendering, model simplification, real-time rendering

9 **Texture mapping 3D models of real-world scenes**

Frederick M. Weinhaus, Venkat Devarajan

December 1997 **ACM Computing Surveys (CSUR)**, Volume 29 Issue 4

Full text available:  pdf(1.98 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#), [review](#)

Texture mapping has become a popular tool in the computer graphics industry in the last few years because it is an easy way to achieve a high degree of realism in computer-generated imagery with very little effort. Over the last decade, texture-mapping techniques have advanced to the point where it is possible to generate real-time perspective simulations of real-world areas by texture mapping every object surface with texture from photographic images of these real-world areas. The technique ...

**Keywords:** anti-aliasing, height field, homogeneous coordinates, image perspective transformation, image warping, multiresolution data, perspective projection, polygons, ray tracing, real-time scene generation, rectification, registration, texture mapping, visual simulators, voxels

10 **Making faces**

Brian Guenter, Cindy Grimm, Daniel Wood, Henrique Malvar, Fredric Pighin

July 1998 **Proceedings of the 25th annual conference on Computer graphics and**

## interactive techniques

Full text available: [pdf\(1.70 MB\)](#)

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### 11 Nonconvex rigid bodies with stacking

Eran Guendelman, Robert Bridson, Ronald Fedkiw

July 2003 **ACM Transactions on Graphics (TOG)**, Volume 22 Issue 3

Full text available: [pdf\(5.19 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We consider the simulation of nonconvex rigid bodies focusing on interactions such as collision, contact, friction (kinetic, static, rolling and spinning) and stacking. We advocate representing the geometry with both a triangulated surface and a signed distance function defined on a grid, and this dual representation is shown to have many advantages. We propose a novel approach to time integration merging it with the collision and contact processing algorithms in a fashion that obviates the need ...

**Keywords:** collision, contact, friction, nonconvex, rigid bodies

### 12 View planning for automated three-dimensional object reconstruction and inspection

William R. Scott, Gerhard Roth, Jean-François Rivest

March 2003 **ACM Computing Surveys (CSUR)**, Volume 35 Issue 1

Full text available: [pdf\(517.25 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Laser scanning range sensors are widely used for high-precision, high-density three-dimensional (3D) reconstruction and inspection of the surface of physical objects. The process typically involves planning a set of views, physically altering the relative object-sensor pose, taking scans, registering the acquired geometric data in a common coordinate frame of reference, and finally integrating range images into a nonredundant model. Efficiencies could be achieved by automating or semiautomating ...

**Keywords:** View planning, object inspection, object reconstruction, range images

### 13 Meshed atlases for real-time procedural solid texturing

Nathan A. Carr, John C. Hart

April 2002 **ACM Transactions on Graphics (TOG)**, Volume 21 Issue 2

Full text available: [pdf\(5.93 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We describe an implementation of procedural solid texturing that uses the texture atlas, a one-to-one mapping from an object's surface into its texture space. The method uses the graphics hardware to rasterize the solid texture coordinates as colors directly into the atlas. A texturing procedure is applied per-pixel to the texture map, replacing each solid texture coordinate with its corresponding procedural solid texture result. The procedural solid texture is then mapped back onto the object's ...

**Keywords:** MIP-map, Mesh partitioning, procedural texturing, solid texturing, texture atlas, texture mapping

### 14 Real-time 3D model acquisition

Szymon Rusinkiewicz, Olaf Hall-Holt, Marc Levoy

July 2002 **ACM Transactions on Graphics (TOG)**, Proceedings of the 29th annual conference on Computer graphics and interactive techniques, Volume 21 Issue 3

Full text available:  pdf(3.45 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The digitization of the 3D shape of real objects is a rapidly expanding field, with applications in entertainment, design, and archaeology. We propose a new 3D model acquisition system that permits the user to rotate an object by hand and see a continuously-updated model as the object is scanned. This tight feedback loop allows the user to find and fill holes in the model in real time, and determine when the object has been completely covered. Our system is based on a 60 Hz. structured-light ran ...

**Keywords:** 3D model acquisition, 3D scanning, range, real-time modeling, scanning

**15 Object-based image editing** 

William A. Barrett, Alan S. Cheney

July 2002 **ACM Transactions on Graphics (TOG) , Proceedings of the 29th annual conference on Computer graphics and interactive techniques**, Volume 21 Issue 3

Full text available:  pdf(18.90 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We introduce Object-Based Image Editing (OBIE) for real-time animation and manipulation of static digital photographs. Individual image objects (such as an arm or nose, Figure 1) are selected, scaled, stretched, bent, warped or even deleted (with automatic *hole filling*) - *at the object, rather than the pixel level* - using simple gesture motions with a mouse. OBIE gives the user direct, local control over object shape, size, and placement while dramatically reducing the time require ...

**Keywords:** animation, image editing, image warping, image-based rendering, texture synthesis

**16 Simulating facial surgery using finite element models** 

Rolf M. Koch, Markus H. Gross, Friedrich R. Carls, Daniel F. von Büren, George Fankhauser, Yoav I. H. Parish

August 1996 **Proceedings of the 23rd annual conference on Computer graphics and interactive techniques**

Full text available:  pdf(549.30 KB)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

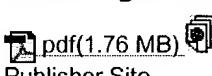
**Keywords:** data reconstruction, facial modeling, facial surgery simulation, finite element method

**17 Smooth view-dependent level-of-detail control and its application to terrain rendering** 

Hugues Hoppe

October 1998 **Proceedings of the conference on Visualization '98**

Full text available:



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**18 A lighting reproduction approach to live-action compositing** 

Paul Debevec, Andreas Wenger, Chris Tchou, Andrew Gardner, Jamie Waese, Tim Hawkins

July 2002 **ACM Transactions on Graphics (TOG) , Proceedings of the 29th annual conference on Computer graphics and interactive techniques**, Volume 21 Issue 3

Full text available: [pdf\(25.36 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We describe a process for compositing a live performance of an actor into a virtual set wherein the actor is consistently illuminated by the virtual environment. The Light Stage used in this work is a two-meter sphere of inward-pointing RGB light emitting diodes focused on the actor, where each light can be set to an arbitrary color and intensity to replicate a real-world or virtual lighting environment. We implement a digital two-camera infrared matting system to composite the actor into the ba ...

**Keywords:** global illumination, image-based lighting, matting and compositing, radiosity, reflectance and shading

**19 Free-viewpoint video of human actors**

Joel Carranza, Christian Theobalt, Marcus A. Magnor, Hans-Peter Seidel  
July 2003 **ACM Transactions on Graphics (TOG)**, Volume 22 Issue 3

Full text available: [pdf\(5.99 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In free-viewpoint video, the viewer can interactively choose his viewpoint in 3-D space to observe the action of a dynamic real-world scene from arbitrary perspectives. The human body and its motion plays a central role in most visual media and its structure can be exploited for robust motion estimation and efficient visualization. This paper describes a system that uses multi-view synchronized video footage of an actor's performance to estimate motion parameters and to interactively re-render t ...

**Keywords:** body model, human motion capture, image-based rendering, multi-video texturing

**20 Painterly rendering with curved brush strokes of multiple sizes**

Aaron Hertzmann  
July 1998 **Proceedings of the 25th annual conference on Computer graphics and interactive techniques**

Full text available: [pdf\(435.89 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

**Keywords:** non-photorealistic rendering

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